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# CLUSTERS: INNOVATION, KNOWLEDGE AND COMPETITIVENESS IN THE WOOD PROCESSING INDUSTRY

Theoretical  
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## Abstract

*This paper proposes an overview of the evolution in the wood processing industry in the process of regional development. The concept of clusters has become more and more popular in recent years, as more and more theorists and practitioners realize its potential; nevertheless the idea of cluster research in the wood processing industry is relatively new. With the shift to knowledge based management, the difference made by creative networks and clusters that promote research, development and innovation is crucial. The purpose of this paper is to underline the benefits that can come from cluster development and outline the impact of clusters on innovation, Knowledge and competitiveness in the wood processing industry and the Romanian Economy.*

## Introduction

Clusters can be defined in many ways depending on the purpose and the specific context in which the term is used. The cluster(ing) concept flourished over the past two decades (Asheim et al. 2006), building on microeconomic and economic-geographic discourses explaining spatial concentration on the basis of static and dynamic localization economies. Only slowly recognizing the importance of the spatial dimension of his cluster concept, Porter (1990) conceptualized clusters as groups of firms operating in related branches of industry at the level of final products, raw materials, equipment, machinery and services, for in-stance, competitors, users and producers of intermediary and final products, and producers of complementary goods and services.

In recent years for many governments around the world and the policy makers of the European Union the development of clusters has become a focal point. Technology clusters are found in many European regions. A concentration of competences, especially in technological clustering, is found in the Nordic countries (Finland, Sweden and Denmark) together with the south of the UK, Germany and France. In these countries many large European organizations are present and invest large sums in R&D. Employment clusters are dominantly found in south and east European regions and Ireland. In central Europe they are often found in combination with technological competences. Many production site companies have been moved from central Europe to other European regions, where employment costs are lower and thus contributed to a rise in employment.( European Commission, 2012)

### What are clusters?

A cluster is not simply an alternative term for an industry. Clusters span industries -- and are unique concentrations of interrelated economic activities. By definition, clusters are geographic concentrations of competitive industries that either have close buy-sell relationships, common technologies, or that share a labor pool that gives businesses within the cluster competitive advantage (Felbinger, Robey,2001).

Clusters can be defined as a group of firms, related economic actors and institutions that are locate close to each other and have reached a sufficient scale to develop expertise, services, resources, suppliers and specialized skills. (Vlasceanu, 2014). A cluster is a geographical concentration of interconnected companies, specialized suppliers or support type organizations of related businesses, in certain areas, which are in competition with each other and that are at the same time cooperating( Sternberg, Litzenberger, 2004)

Following development of the concept of interorganizational networks and practical development of clusters; many perceive there are four methods by which a cluster can be identified(Wikipedia.org- Business clusters):

- Geographical cluster
- Sectoral clusters (a cluster of businesses operating together from within the same commercial sector e.g. photonics (Aston Science Park, Birmingham))
- Horizontal cluster (interconnections between businesses at a sharing of resources level e.g. intellectual property, knowledge based management)
- Vertical cluster (i.e. a supply chain cluster)

Taking into account the type of comparative advantage several types of business clusters, based on different kinds of knowledge, are recognized:

- High-tech clusters - These clusters are high technology-oriented, well adapted to the knowledge economy, and typically have as a core renowned universities and research centers, e.g. the East London Tech City or Paris-Saclay.
- Historic know-how-based clusters - These are based on more traditional activities that maintain their advantage in know-how over the years, and for some of them, over the centuries. They are often industry specific. For example: London as financial center.
- Factor endowment clusters - They are created because a comparative advantage they might have linked to a geographical position. For example, wine production clusters because of sunny regions surrounded by mountains, where good grapes can grow. This is like certain areas in France, Lombardy, Spain, Chile or California.
- Low-cost manufacturing clusters - These clusters have typically emerged in developing countries within particular industries, such as automotive production (Bordei, 2014), electronics, or textiles. Cluster firms typically serve clients in developed countries. Drivers of cluster emergence include availability of low-cost labor, geographical proximity to clients (e.g. Eastern Europe for Western European clients).( Altenburg, Meyer-Stamer, 1999).

- Knowledge services clusters - Like low-cost manufacturing clusters, these clusters have emerged typically in developing countries. They have been characterized by the availability of lower-cost skills and expertise serving a growing global demand for increasingly commoditized (i.e. standardized, less firm-specific) knowledge services. Multinational corporations have played an important role in 'customizing' business conditions in these clusters (Manning, 2008). One example for this is the establishment of collaborative linkages with local universities to secure the supply of qualified, yet lower-cost engineers. (Manning, Sydow, Windeler, 2011).

The theoretical foundation of cluster and network formation, transaction-cost-reducing characteristics of cluster and network arrangements are identified as follows (Sydow 1992):

- Long-lasting arrangements between suppliers or clients reduce the transaction-cost-specific investment risk.
- Network-specific stable and intensive exchange relationships enable a precise knowledge of the strengths and weaknesses of potential clients or suppliers and ultimately result in lower costs for search and negotiation.
- The creation of inter-organizational dependencies and the practice of control reduce opportunistic behavior.
- An increase of technological interdependencies allows the immediate assertion of product and process innovations.
- Risks in quality can be reduced by mutual information.
- Inter-organizational learning is accelerated.
- Trust-building measures result in the establishment of a clan-like inter-organizational culture in which opportunistic behavior results in an imminent exclusion from the clan.

#### **Innovation clusters and regional development**

The EU regional is based on intangible networking like clusters that supports the effectiveness of transformation in EU regions (Pachura P., 2010)

A flexible organization in which each company performs certain activities in line with the market demand and the cluster strategy and organizational learning which is often stated as an objective of cluster function and formation are crucial elements. Michael Porter in *The Competitive Advantage of Nations* (1990) claims that clusters have the potential to affect competition in three ways: by increasing the productivity of the companies in the cluster, by driving innovation in the field, and by

stimulating new businesses in the field. Maintaining a competitive advantage is crucial. Porter argues that economic activities are embedded in social activities; that 'social glue binds clusters together'(Porter 1998). In regional and rural areas, significantly more innovation takes place in communities which have stronger inter-personal networks.

Blien and Maier in 2008 underline that innovation dynamics and the structure and evolution of industrial clusters are two empirical issues that require a careful analysis of the local economic context and a identification of the types of organizations that operate in that environment in particular. "Identifying the characteristics of the firms, their transactions, and their relations with other firms will then allow us to make realistic assessments of how the firms will most likely perceive the effects of unintended outward knowledge spoilers. On this basis we can then begin to make predictions regarding the types of local behavior, and the modes of local innovation generation"( Blien and Maier, 2008).

Muffatto and Giacon said in 2012 that " clusters are increasingly seen in modern economies as strong building blocks for accelerating industrial transformation and developing new competitive advantages in a region that will speed up the creation of new companies and jobs and drive economic growth(Muffatto, Giacon, 2012).

#### **Clusters and cluster policies in the EU**

Due to the increasing importance of clusters, a large number of policy initiatives were launched and implemented in Europe aiming at fostering existing clusters or creating favorable conditions for encouraging new ones.

In January 2008, the launch of the European Cluster Memorandum marked an important step in supporting cluster development. The memorandum points out that the European Commission in association with the Member States should prepare a framework concept outlining the strategy for supporting the creation and growth of world-class clusters in Europe. In October 2008, the Commission's Communication entitled „Towards world-class clusters in the European Union: Implementing the broad-based innovation strategy „outlined a policy framework for action which aims to raise the level of excellence and openness of clusters. Besides efforts to improve the framework conditions, this includes:

- establishing a high-level European Cluster Policy Group to explore ways to best assist EU countries in supporting clusters
- expanding the policy dialogue under the European Cluster Alliance (under PRO INNO Europe®)

- fostering transnational cooperation between cluster organizations at a practical level in view of developing and testing new or better innovation support tools for cluster firms (European InnovationPlatform for Clusters (Cluster-IP) under Europe INNOVA)

The “European Cluster Alliance”, created under the PRO INNO Europe initiative, provides a platform bringing together regional, national and European actors, with the objective to define and implement a European cluster policy agenda. The role of the Commission in this process is to facilitate all forms of cooperation that could lead to more competitive clusters in Europe, by providing neutral economic analysis on existing and emerging clusters, identifying good practice, providing intelligence on opportunities for cooperation and facilitating networking at practical and strategic levels. Ongoing European policies are complementary to regional and national efforts to build strong clusters in Europe, thereby contributing to a consolidation of the scattered cluster picture in Europe, including the facilitation of cooperation between regions of unequal development (European Commission, 2013)

According to the INNO-Policy TrendChart in cooperation with the ERAWATCH tool, more than 130 specific national measures supporting clusters were identified in 31 European countries in 2008 (European Commission, 2012).

A survey of cluster organizations in Europe reveals that cluster organizations put their focus on building an identity, a strategy and brand for the cluster, and enhancing innovation through collaboration across innovation gaps and joint R&D projects. Less focus is put on business development among member firms (export promotion, commercial cooperation and joint purchasing). (Ketels, Lindqvist, Solvell, 2012).

Cluster based strategies – as part of industry, innovation, regional and science policy – should account for both a rejuvenation of established industries in Europe, as well as paving the ground for new emerging industries. The chances of success are improved if such policy initiatives are fact-based. (Borbei, 2014)

The Commission study on internationalization opportunities for SMEs in 2011 found that SMEs face particular obstacles to tapping the global market, not when it comes to access to market information, locating possible customers and finding the right partners. Complex issues such as compliance with foreign laws, mandatory rules of contract law, customs rules, technical regulations and standards, managing technology transfer and protecting intellectual or industrial property rights can be seen as barriers in competing on the global market. In dealing with such challenges SMEs in

the wood processing industry are usually less well equipped than larger enterprises with in-house expertise and financial or human resources.

### **Clusters in Romania – the wood processing industry**

In 2013, SMEs in the non-financial business sector in Lithuania, Latvia, Malta, and Romania, posted a positive and strong performance in terms of number of firms, employment and value added, with gains higher than 3% (Annual report on European SMEs 2013/2014: a partial and fragile recover, 2014)

The wood processing industry in Europe is undergoing a period of change marked by increasing global competition, a far-reaching transformation of the supply chain and high innovation dynamics. (European Commission, Creative industries trigger innovation spill-overs in other industries, 2014). The resulting innovation and cost pressure is felt particularly hard at the level of small and medium size enterprises (SMEs). Over the last years cluster initiatives in the wood processing industry have been established across the Globe with the aim to support the regional supply industry. Innovation networks between wood processors, suppliers, research institutions as well as supporting institutions have proven successful in responding to new market and technological challenges. Globalization demands competitive advantages from SMEs in the wood processing industry that begin with a global strategy and can move quickly to take advantage of cross-border activities. Providing support is a key step in allowing SMEs to leverage the benefits of increased foreign demand for goods and services. For example the FSC marketplace promotes global opportunity and equality in trade by helping users find FSC certified suppliers and buyers across international borders ([www.marketplace@fsc.org](http://www.marketplace@fsc.org)). Not only is the marketplace a way to promote global competition and clusters but it is also a way to mitigate climate change.

Towards Europe 2020, the European Commission adopted a comprehensive innovation strategy to enhance Europe's capacity to deliver smart, sustainable and inclusive economic growth. This strategy concerns the so called concept of Smart Specialization Strategy in different key regions. It is of crucial importance, especially for less developed economic regions. According to this concept, each region must set its own innovation priorities and streamline public funds in those technological fields, where certain advantages and thus exploitation prospects exist.

The forests in Romania represent an important economic potential for the development of the rural region. Measures for the rational administration of the forests have been imposed in order to turn the Romanian forests into an important factor for the

superior capitalization of the rural area, the development and the modernization of the wood processing industry in competitive organizations/production units which take into account the traditions and qualified workforce.

In the less developed economic regions in Romania where there is a constant supply of wood raw material and an abundance of qualified work force the wood processing industry represents a Smart Specialization Strategy. Due to the low cost with labor and raw materials compared to other west European countries clusters in this industry could represent for SMEs a solution to cut down on costs with research, development and innovation (Rusu, 2013).

A powerful knowledge management within a cluster leads to exploitation and processing at a higher level of information and knowledge - because of the high potential of research and innovation of the cluster - consequently, the effect can only be increased business efficiency and competitiveness of member firms of the cluster, which leads in its turn to the economic development of the region in which the cluster belongs (Vlasceanu, 2013).

This ripple effect that could arise from this when industries benefiting from an increase in foreign demand increase their employment and purchases of goods and services from suppliers to meet the additional foreign demand, and in turn this increase in employment and production at suppliers will further boost employment and production in other industries in the area. (Annual report on European SMEs 2013/2014: a partial and fragile recovery, 2014)

### Conclusions:

The transition of the Romanian economy to the knowledge based management in firms in the wood processing industry is a complex and continuous process, which is based on building a knowledge culture, continuous learning and fostering research, development and innovation. Implementing the idea of clusters in the wood processing industry would be a good way through which the transfer of knowledge and better response to environmental changes from small and medium enterprises can be achieved in order to compete with large companies internally and internationally. The development of clusters in the Romanian economy would influence the economic growth and competitiveness with a huge impact on innovation, knowledge and competitiveness.

In the wood processing industry clusters would represent the ideal structures for some companies to build their skills, knowledge and know-how together. To some extent, this form of organization enables the creation of common structures and/or facilities, which allow the smaller organizations or the ones that lack experience, knowledge and

expertise to learn from others. The benefit of this collaboration cooperation and /or coordination determines more advanced capabilities and thus the organizations grow and share the risks and research and development costs together. Moreover by incorporating universities, institutes and research centers, NGO and other entities leads to the growth and economic development of the region from which the cluster is part of.

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